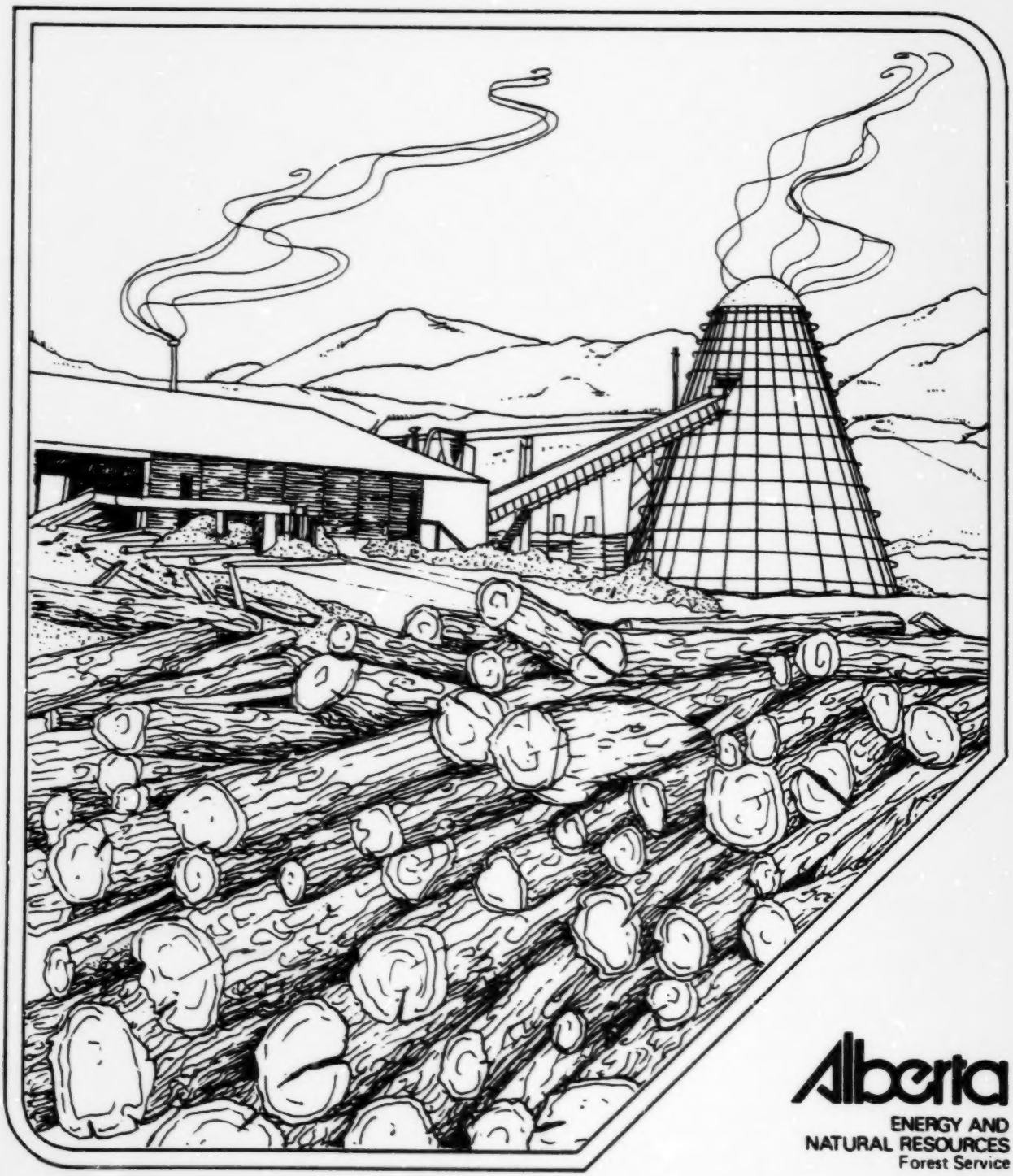
Guidelines for Manufacturing Inspections



Alberta

ENERGY AND
NATURAL RESOURCES
Forest Service

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GUIDELINES

FOR

MANUFACTURING INSPECTIONS

1984
Edmonton

ALBERTA ENERGY AND
NATURAL RESOURCES
FOREST SERVICE

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ADDITIONAL COPIES OF THE REPORT ARE AVAILABLE AT:

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ABSTRACT

The objective of carrying out mill inspections is to encourage full utilization at primary processing plants. Mill inspections identify points at which waste occurs, potential forest fire problems and omissions in record keeping.

The Forest Service has a responsibility to ensure Crown timber is not wasted during the manufacturing process. This responsibility is stated in The Forests Act, 1971 and in the Timber Management Regulations.

These guidelines have been written to assist the inspecting officer to determine at what point the situations become unsatisfactory. The determination is largely based on knowledge and experience. The guidelines also standardize the measurement techniques so that individual mill studies will be conducted in a uniform and consistent manner.

It is not possible to issue specific guidelines for many of the situations that may develop. In such cases the inspecting officer must use discretion in a visual assessment to determine if waste is significant.

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1. INTRODUCTION

The manufacturing inspection report provides a guide for the inspecting officer. It covers most of the phases of manufacturing. However, as situations almost always vary from plant to plant, some of the items may not pertain to the plant being inspected and should be indicated by marking NA on the form.

Situations may occur that are not provided for on the form. In these cases a memo should accompany the report indicating what those situations are, whether they are satisfactory or unsatisfactory and what action is recommended.

It is not sufficient to simply mark on the inspection report that a practice is unsatisfactory. A clear, concise and complete description must be given in the remarks section (or on a separate attachment) of any unsatisfactory condition. This condition must be explained so the operator as well as the Alberta Forest Service understand the nature and the degree of the unsatisfactory situation.

In most cases an unsatisfactory situation can be corrected by reviewing the report with the operator. This is the preferable route. The inspecting officer must explain the nature of the unsatisfactory condition and what can be done to rectify the problem. In highly technical situations (i.e. kiln schedules, machine adjustments, etc.) the inspecting officer can identify the problem but is not likely to have the expertise to instruct the operator how to correct the problem.

It is important that the inspecting officer appreciate that the purpose of the inspection is not merely to find unsatisfactory conditions but to note where operations are satisfactory as well.

If the inspecting officer has to recommend penalty action for an unsatisfactory condition, his recommendation should be supported by the descriptions on the current inspection report as well as on previous reports.

The operator should sign the report and a copy should be left with him.

FIGURE 1

TM 138

Alberta
ENERGY AND
NATURAL RESOURCES

MANUFACTURING INSPECTION REPORT

DATE LAST INSPECTION	DATE THIS INSPECTION	RANGER DISTRICT	MILL FILE NUMBER

TYPE OF OPERATION (SAWMILL, PLANER, ETC.)

DUES METHOD: WEIGHT SCALE ☐ SALES ☐

OWNER

OPERATOR

LOCATION (TOWN OR DESCRIPTION)

WOOD SOURCE (FMA, LICENCE, PERMIT, SALVAGE, ETC.)

1. SITE DEVELOPMENT AND MAINTENANCE	SATISFACTORY	UNSATISFACTORY
(a) Proper Disposal of debris from Clearing		
(b) Site Clearance and Spacing Installations		
(c) Mill Residue Utilization or Progressively Disposed		
(d) Employment of fire guarded burner		
(e) Fire Equipment Adequacy and Maintainance		
(f) Campsite Maintainance		

2. YARD HANDLING		
(a) Stock segregation required on sales operations		
(b) Progressive log inventory utilization		
(c) Breakup		
(d) Trees bucked to full utilization		

3. MANUFACTURING		
(a) Fibre Loss in Debarking		
Slabs		
Edgings		
(b) Trimming		
(c) Uniformity of Sawn Lumber		
(f) Lumber dimensions		
(g) Lumber grading		

4. PLANER MILL		
(a) Drying defects		
(b) Skip from scant saw no.		
(c) Trim		
(d) Lumber storage		

5. RECORDS

(a) Records checked: MANUFACTURING (TIMS) ☐ SALES (TIMS & TMBS) ☐ PURCHASE (AFSW) ☐

(b) Period 19 to 19	SOURCE	FBM	m^3	m^3 (STACKED)
(c) Volume Manufactured				
(d) Volume Sold				

FOREST OFFICER'S REMARKS

ITEM	REMARKS

MILL OWNER'S OR OPERATOR'S SIGNATURE

SIGNATURE OF FOREST OFFICER

2. INSTRUCTIONS FOR COMPLETING MANUFACTURING INSPECTION REPORT

2.1 Site Development and Maintenance

2.1.1. Proper disposal of debris from clearing

Authority: Forest and Prairie Protection Regulations - Part II (Sections 3 and 4).

Comments: Total disposal should precede construction of the mill. This refers to debris from the original site clearing or expansions of the site.

2.1.2 Site clearance and spacing of installations

Authority: Forest and Prairie Protection Regulations - Part I (Section 12).

Comments: An order to control fire hazard may be recommended under section 25 of The Forest and Prairie Protection Act where spacing of installations is not covered by regulations (i.e. distance of sawmill to burner).

2.1.3 Mill residue utilization or progressively disposed

Authority: Option 1

Forest and Prairie Protection Regulations - Part II (Section 12 and 13).

Option 2

The Forest and Prairie Protection Act - (Section 25).

Comments: Mill residue refers to slabs, edgings, trim, sawdust, tops, limbs, broken pieces, etc. Fire danger removal order should only be considered as a last resort.

2.1.4 Employment of fireguarded burner

Authority: Burner type:

Forest and Prairie Protection Regulations - Part II (Section 12 and 13).

Fireguard:

Forest and Prairie Protection Regulations - Part I (Section 12(c)).

Comments: Refer to fire control plan for specifications of burners.

2.1.5 Fire equipment adequacy and maintainance

Authority: Forest and Prairie Protection Regulations - Part I (Section 26 and 27).

Comments: Reference should be made to any approved fire control plan for the specific operation.

2.1.6 Campsite maintenance

Authority: Option 1

Timber Management Regulations - Section 100(h) & (i).

Option 2

Enforcement: Public Lands Act - Section 51

Offence: Public Lands Act - Section 51 (1)(c)

Penalty: Public Lands Act - Section 55

Comments: This refers to litter disposal and unsightly property. Reference should be made to the conditions of the disposition (Miscellaneous Permit).

2.2 Yard Handling

2.2.1 Stock segregation (required on sale operations)

Authority: Option 1

Timber Management Regulations - Section 112.

Option 2

Timber Management Regulations

- Section 100 (a) can be applied if annual operating plan provides for segregation.

Comments: Logs must be segregated until sawn and lumber volumes are recorded on form TM 97 Record of Logging and Sawing. Lumber from different licences and purchased stock can then be mixed.

2.2.2 Progressive Log inventory utilization

Authority: Timber Management Regulations - Section 100 (d) and (e).

1. The timber year that timber is delivered to a millyard must be known.
2. A volume estimate, however crude, must be made, either of the timber being wasted or of the log decks that are subject to excessive waste.

To remedy those situations which have a high potential for waste and to implement a reliable system for the control of log inventory in these yards, the following action is required:

1. Immediately before a new logging season, an inspection should be made on all millyards carrying a substantial inventory. Thus, mills having an inventory of logs equivalent to three months' production should be considered.

   A rough sketch should be made to identify the location of the log piles by year and showing approximate volumes or size of the decks. The sketch should be dated and signed by the inspecting officer.

2. As this inspection is being done, the appropriate timber year should be spray painted on the butt ends of a number of trees in the deck. For instance, some trees in the deck would be marked with the number 81 for the timber delivered to the yard from May 1, 1981 to April 30, 1982.

   If timber from a previous year is in the yard and can be identified as to the year delivered, it should be marked 82, 83, etc. If a log deck is found which was delivered before 1983, but the year of delivery cannot be determined, it should be marked 83.

   As these mill sketches are being prepared, the waste of merchantable wood and breakage in log handling should be documented. Waste, such as debris piles containing merchantable timber and breakage in log handling is usually best documented by a photo-

graph of the yard and written recommendations for action to rectify the situation. (A letter to the company outlining the problem and the recommended action will usually get any problem solved.)

In the majority of cases, further action is not necessary as the sawmill owner or operator will be well aware that problems have been well documented.

The value of the millyard sketches and of the log inventory will not likely be fully realized for a couple of years. However, if the number of years the logs have been in storage is known, the department will be able to ensure logs stored the longest are used first.

The inspecting officer must recommend a penalty for any timber operator who has refused to give priority in using logs which are three or more summers old.

2.2.3 Breakage

Authority: Timber Management Regulations - Section 100 (e).

Comments: Excessive breakage is hard to define. However, it should be possible to eliminate breakage by discussion with the operator. If, after discussion, the situation does not improve, documentation should begin.

2.2.4 Trees bucked to full utilization

Authority: Trim: Timber Management Regulations
- Section 99 (Scaling Procedures).

Penalty: Timber Management Regulations
- Section 100 (e).

Comments: Watch for operator error in all bucking systems. Refer to scaling instructions for details on trim allowance and bucking defects (including crook and sweep).

Documenting: The sample must be taken in an unbiased manner, and not just those logs which are over length. (i.e. measure all logs on green chain or measure every fourth log, etc.). Do not measure top logs for the sample.

At least 100 measurements per sample should be taken. All measurements should be taken to the nearest centimetre and recorded. The following are tallied as being bucked incorrectly:

(1) All logs falling over the trim allowance.

(2) All logs so short that the end product has to be trimmed back to the next length class.

If more than five per cent of the logs fall outside the above limits the situation should be classified as being unsatisfactory.

2.3 Manufacturing Items

Authority: The following items are under the authority of: Timber Management Regulations - Section 100(e).

2.3.1 Fibre loss in debarking

Comments: Some types of debarkers remove a large amount of wood fibre with the bark, particularly from frozen logs. This can result in loss of lumber in certain critical log sizes and, at least, loss of chip revenue. Inspection of the debarked logs will indicate the wood fibre loss and whether or not remedial action should be taken.

2.3.2 Slabs

Comments: By checking the lumber, the number of short or medium length 1" X 4"s (19 mm X 89 mm)[1] is a good indication as to whether slabbing is heavy or light. If there are few 1" X 4"s (19 mm X 89 mm)[1] there is a chance of heavy slabbing.

In many newer mills chipper canters or chip and saw units are employed. These machines shoud be set to the cant size for each log.

There is a tendency on high speed operations for the operator to produce a constant size (i.e. A four inch (10 mm) cant) rather than reset the machine. See Appendix 3 - Slab Study for documentation.

[1]Metric sizes are based on equivalents to actual surfaced size (3/4" X 3 1/2").

2.3.3 Edgings

Comments: This requires some observations at the edger but again, visual check of the lumber to see what per cent has edges with wane is a very good guide to judge whether edgings are too heavy or too light. If there is no wane on the lumber, edging is heavy.

It should be noted that a fair degree of wane is allowed in lumber. See Appendix 1, which is a condensation of the grading rules. Pay particular attention to the amount of wane allowed on No. 2 and better grades and the stud grade. There is normally an acceptable profit margin in all these grades. An operator should not be faulted for attempting to upgrade from No. 3 or economy by use of the edger. Remember however, that you are inspecting rough lumber and there can be more wane than is specified in the grading rules as some wane will be planed off.

2.3.4 Trimming

Comments: There should be no trimming for grade at the sawmill. Trim should be only for rot or excessive wane such as snipe ends. (Refer to Appendix 4 - Trimming Studies for documentation.)

2.3.5 Uniformity of sawn lumber

Comments: The tolerance limits will be the same as shown in Section 6. See Appendix 5 for lumber measurement procedures.

If wedge-shaped lumber is the problem, measurements are taken as outlined in Appendix 5. The sizes are still subject to the same tolerance limited.

If resawing is definitely a proven practice the maximum tolerance limits may be extended by 1/4 inch to allow for resawing from four inches to two inches or from two inches to one inch.

When lumber is partially air dried and subsequently surfaced to a green size some shrinkage may occur prior to surfacing. In this situation, to compensate for the shrinkage loss, an additional allowance of half the shrinkage allowance may be added to the maximum tolerances. The allowance is only applied when the lumber is actually planed to the green size.

2.3.6 Lumber Dimensions (Rough)

To check lumber dimensions, measurements are taken as outlined in Appendix 5.

TABLE 1

TABLE OF LUMBER SIZES

SHOWING CALCULATION OF TOLERANCE LIMITS FOR ROUGH LUMBER

THICKNESS								
Nominal Size	Dressed Dry (inches)	Shrinkage Allowance (inches)	Surfacing Allowance (inches)	Tolerance Limits (inches) Minimum	Maximum*	Metric Size (mm)	Tolerance Limits (mm) Minimum	Maximum
1	3/4	1/16	2/16	15/16	1 3/16	17	24	30
2	1 1/2	2/16	2/16	1 12/16	2	38	44	51
WIDTH								
Nominal Size	Dressed Dry (inches)	Shrinkage Allowance (inches)	Surfacing Allowance (inches)	Tolerance Limits (inches) Minimum	Maximum*	Metric Size (mm)	Tolerance Limits (mm) Minimum	Maximum
2	1 1/2	2/16	2/16	1 12/16	2	36	44	51
3	2 1/2	2/16	2/16	2 12/16	3	64	70	76
4	3 1/2	3/16	2/16	3 13/16	4 1/16	89	97	103
6	5 1/2	4/16	2/16	5 14/16	6 2/16	140	149	156
8	7 1/4	6/16	2/16	7 12/16	8	184	197	203
10	9 1/4	7/16	2/16	9 13/16	10 1/16	235	249	256
12	11 1/4	8/16	2/16	11 14/16	12 2/16	286	302	308

* This column allows for sawing variation of 1/4".

2.3.7 Lumber Piling

Comments: (a) Pile foundation should at least be squared timbers on firm ground.

(b) Crossers or stickers must be aligned over foundation supports.

(c) End stickers should be at or very near the end of the pile.

(d) Stickers should be approximately one metre (three feet) apart.

Refer to Canadian Woods (E.J. Mullins and T.S. McKnight 1981, 3rd edition, P. 162) for background. The best documentation on faulty lumber piling is gathered by means of dated photographs.

Faulty lumber piling usually results in bowed, cupped or twisted lumber. This can show up in the planer mill and is further discussed under that section.

2.4 Planer Mill

Authority: The following items are under the authority of: Timber Management Regulations - Section 100(e).

2.4.1 Drying defects

Comments: Watch for case hardening or poor piling which causes warp. See Canadian Woods and Appendix 1.

Drying defects are usually due to improper kiln scheduling.

2.4.2 Planer skip

Definition: Areas on a piece of lumber that fail to surface clean of skip.

Comments: Skip is serious because it can reduce the grade to cull.

It is caused by scant sawing and improper drying.

See Appendix 1.

2.4.3 Trim

Comments: Watch for:

(i) Trimming to fill order specifications.

Example: Trimming two feet (60 cm)[1] from sound 16 foot (4.8 m) stock to meet a special order for 14 foot (4.3 m) stock.

Procedure: - Document and recommend penalty on first offence.

(ii) Excessive trimming for grade. See Appendix 1. Operators may upgrade economy, utility or No. 3 by trimming.

2.4.4 Lumber storage

Comments: Lumber should be stored or progressively shipped in a manner that minimizes degrading.

Documenting: Photographs are a good means of documenting improper storage.

[1]Metric units are approximate common length equivalent.

2.5 Records

Authority: Timber Management Regulations - Section 112, 113, 114, 116, 117, 121 and 122.

Comments: (a) Field staff are the primary supervisors of the record-keeping practices of the timber operator. The main purpose is to ensure that records are kept up to date and complete.

(b) The inspecting officer should date and sign the operator's records when he/she checks them. No signature or other mark should be placed on forms not properly checked. Corrections should be initialed neatly without obliterating original entries to identify person making them.

2.5.1 Form TM9 Form for Forest Products Only

This is the main form used in keeping track of timber movements as follows:

a. A record of trees hauled from a cutting area to a primary production site.

b. A record of rough manufactured products hauled from a primary production site to another site.

c. A record of a timber sale. A sale can be made from any point, from the cutting area on down the line, and the timber may be in any form. The criteria are that ownership of the timber is transferred from one party to another and that the date of shipment is taken as the date of sale.

The same timber can appear on form TM9 more than once. The set that established the volume on which Crown charges are assessed are the ones critical in auditing.

Some companies have the option of using their own form if approved. If a form is in question the officer should contact Head Office to verify approval.

2.5.2 Form TM97 Record of Logging and Sawing

This book is now used mainly by non-weigh scale lumber producers. Its main purpose is to record daily cutting, logging and sawing production.

The smaller lumber producer should be encouraged to use these books. If the timber comes from more than one source, one book should be used for each source or at least clearly show a breakdown by volume for each source.

With effective supervision of stock segregation until after sawing, coupled with complete and accurate records of volumes produced entered in form TM97, a mill handling timber from multiple sources can be easily audited.

2.5.3 Form AFS196 Purchase Journal of Forest Products

This book is used mainly by the non-scale operator. It should also be required of all non-scale operators who obtain timber from sources other than their own dispositions.

The main difficulty with this book is determining volumes to be entered for unmanufactured trees or logs that were purchased. Entry of estimated volumes should be discouraged.

All loads purchased should be entered with date, vendor and form

TM9 number. Then, if yard segregation and the Record of Logging and Sawing are properly maintained, it will be simple to draw a bracket around the loads from any particular source and enter one volume for these loads once this volume is known.

Operators should use as many of these books as they need to keep their purchases recorded separately.

2.5.4 Form TM65 Sales Record of Forest Products

This form is used mainly by non-scale operators. Most scale operators have their own sales journal which may include financial data as well as timber volumes. The substitute must provide the same information on date, form TM9 number, purchaser, cutting source and volume sold. If it does, then it can be accepted.

There is no reason why a larger company or a scale operator should not use form TM65.

During mill inspections this form should be checked to determine whether or not it is up to date. This can be done by checking to see whether or not the most recent forms TM9 used for sales have been entered. As well, it is important that complete information be entered.

In a yard where manufactured products are mixed after they are manufactured, it is often impossible to determine the source of any load sold. This is where the importance of the Record of Logging and Sawing and the Purchase Journal becomes apparent.

Sales recorded in a sales journal against any source should not exceed the volume manufactured or purchased from that source.

The operator must keep track of how much timber he/she has produced from any source. The choice is his/hers as to which source is

recorded for any particular sale, as long as he still has volume from that source on hand.

In non-scale operations, sales of manufactured products should not be charged against logs or trees which are not yet manufactured. This, however, may be done in a scale yard since the volume of these logs or trees is already established and segregation of logs or trees until they are manufactured is not necessary.

2.5.5 Form TM32 Log Scale Tally Sheet

Because there are numerous entries under unfavorable conditions, this form has the greatest potential for errors. A check of extensions and additions is therefore necessary.

The intensity of checking should be high at the start of each operating season and whenever a new scaler starts working, until the inspecting officer is satisfied the accuracy is acceptable. The district office is expected to check as many loads as time and work load allow.

Sample loads with fewer errors that amount to less than plus or minus 1/10 of one per cent of the net volume of the load need not be corrected on the form TM44 Sample Ledger and Volume Compilation Sheet.

2.5.6 Form TM35 Weight Scale Load Record Sheet

Errors on form TM35 are usually not too numerous. Errors can occur in transferring the net weight from form TM9 to form TM35. Errors can occur in column additions of net weights on form TM35.

Where timber from more than one source enters a scale yard in the same month a separate TM35 must be used for each source.

2.5.7. Form TM44 Sample Ledger and Volume Compilation Sheet

Provided the data on the forms TM9, TM32, TM35 is correct, errors should seldom occur on this form. Errors are sometimes made in the transfer of this basic data from the preliminary forms to TM44 and mathematical errors are sometimes made on TM44. The results of the TM44 should be reported on the Form TM7 Timber Return.

The checking of weight scale records (forms TM32, TM35 and TM44) must be documented on the Form 119 Monthly Check Scale Report.

APPENDIX 1

EXTRACTS FROM GRADING RULES

Classifications of Knots and Warp	1(a)
Minimum Specifications for:	
- Light Framing	1(b)
- Structural Joists and Planks	1(c)
- Stud Grades	1(d)
- Boards	1(e)

APPENDIX 1(a)

Classification of Knots and Warp

320. MEASUREMENT OF KNOTS FOR STRESS GRADES

(i) GENERAL

The sum of the sizes of all knots in any 6" of length of a piece must not exceed twice the size of the largest knot permitted. More than one knot of maximum permissible size must not be in the same 6" of length and the combination of knots must not be serious.

(Illustrations on the following pages are examples only. Judgment must be used in measuring the many different knots that occur in natural growth for equivalent effect on a piece.)

(ii) In all framing lumber 4" and less in thickness, the size of a knot on a wide face is determined as shown in Para. 320b. Narrow face and spike knots are measured by the displacement method. Framing lumber 4" and less in thickness is graded full length with listed knot sizes applying full length.

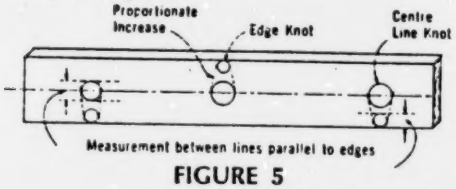
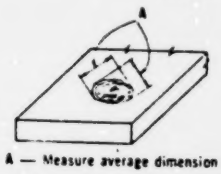


FIGURE 5



320a. Unless otherwise specified, knots shall be measured as the average of the maximum and minimum diameters as shown in Figure 6.

FIGURE 6

320b. In grades of Studs, Light Framing, Structural Framing and other grades where specified, knots on wide faces are measured between lines parallel to the edges as shown in Figure 7. When tapering knots are encountered, their equivalent displacement is determined as shown in Figure 8. Narrow face and spike knots are judged by the amount of cross section they occupy as illustrated in Figures 9 and 10.

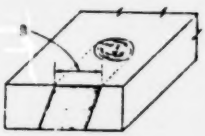


FIGURE 7

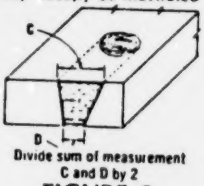


FIGURE 8

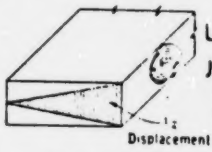


FIGURE 9

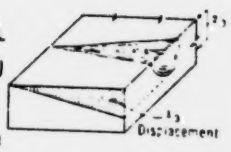


FIGURE 10

A GUIDE FOR THE CONTROL OF NARROW FACE OR SPIKE KNOTS IN 2 x 4 LIGHT FRAMING

Knots Spiked Entirely Across the Wide Face	Narrow Face Knots and Knots Spiked Not Entirely Across the Wide Face
Construction ¼ displacement	Construction ⅓ displacement
Standard ⅓ displacement	Standard ½ displacement
Utility ½ displacement	Utility ⅔ displacement

Crook Bow Cup Twist

Cup is a curve across the width of a piece and is measured at the point of greatest distance from a straight line drawn from edge to edge of the piece. It may be caused by uneven drying with a resultant uneven contraction of the two faces. Then again it may be due to the fact that vertical grain contracts less than flat grain and a piece of lumber, due to the turning of the rings, may be flat-grained on one face and vertical-grained on the other. Cupping in lumber of this type is unavoidable.

Crook is a deviation edgewise from a straight line drawn from end to end of a piece and is measured at the point of greatest distance from the straight line. It is often caused by a "pulling" of the board during seasoning or as a result of a knotty or irregular fibre formation in the wood.

Bow is a curve along the length of a piece. That is, it is a deviation flatwise from a straight line drawn from end to end of a piece and is measured at the point of greatest distance from the straight line. It does not include short kinks.

Twist is a deviation flatwise, or a combination of flatwise and edgewise, in the form of a curl or spiral, and the amount is the distance an edge of a piece at one end is raised above a flat surface against which both edges at the opposite end are resting snugly.

Refer to NLGA Rules for amounts of warp permitted. Para. 752, 810a to d.

Fuzzy Tongue or Groove is a condition which occurs as a result of planing damp lumber. It is especially pronounced when the knives have been ground to dress dry lumber.

Collapse, Casehardening and Internal Checking (Honeycombing) are caused by the lumber being subjected to improperly controlled temperatures during kiln drying.

Standard Finished Sizes may be found in para. 820a, b, c & d of NLGA rules. It is not necessary to memorize these tables; a knowledge of where to find and how to use them is quite sufficient.

APPENDIX 1(b)
Light Framing
2" to 4" thick and 2" to 4" wide

Extracts from Grading Rules

Grades	Construction	Standard	Utility	Economy
Uses:	Generally good appearance but mainly graded for strength uses	Generally used in small quantities along with construction (i.e. sold as standard & better)	Studding, Blocking, Bracing uses	Temporary construction, dunnage, etc.
Wane:	1/4 T x 1/4 W x Full length 1/3 T x 1/3 W x 1/4 length	1/3 T x 1/3 W x Full length 1/2 T x 1/2 W x 1/4 length	1/2 T x 1/2 W x Full length 2/3 T x 2/3 W x 1/4 length	3/4 width. If across face 1/2 width must not be more than 1/4 scant for 1/3 length or equiv.
Skips:	Hit & miss - 1/16" x 4' or equivalent	Hit or miss, or heavy skip (1/8" deep) - 2' long	Hit or miss, heavy skip (1/8" deep) Full length	1/4" scant any direction
Bark pockets:	Large (4 sq. inches)	Not restricted	Not restricted	Not restricted
Stain and rots: Refers to stains, white specks, honeycomb and unsound wood (soft rot)	Stain allowed. No white speck, no honeycomb, no soft rot. Unsound knots may be allowed as holes	Stain allowed. White speck - 1/3 volume. Honeycomb - 1/6 width x 2' (2 per 12'). No soft rot	Stain allowed. White speck allowed. Honeycomb (firm) allowed. Soft rot 1/3 of cross section x 1/10 length	Stain, white speck, honeycomb - allowed. Soft rot - 3/4 of cross section
Splits:	Short (equiv. to width of piece	1.5 x width of piece - allowed each end	1/6 length - allowed each end	1/3 length
Shakes and checks:	Not Thru. Several up to 2' long	Not Thru - 3' up to 1/4 length. Thru - 2' long. If thru on side 3/4 thickness	Thru - several 1/3 length. If thru and side 1/2 thickness and 1/6 length and should not be less than slope	Not restricted except if restricts use of piece
Slopes of grain:	1 in 6	1 in 4	1 in 4	Not restricted
Warp: (Cup (C), Crook (CR), Bow, Twist)	1/2 medium (see tables of grading manual) i.e. 2 x 4 x 8. C = 1/32", CR = 1/4", B = 1/2", T = 3/8"	Light (See tables of grading manuals) 2 x 4 x 8. C = 1/32", CR = 3/8", B - 3/4", T = 1/2"	Medium (See tables of grading manuals) i.e. 2 x 4 x 8. C = 1/16", CR = 1/2", B = 1", T = 3/4"	Not restricted
Knots and holes: (Knot sizes may occur anywhere on wide face)	Face Width (Nominal) / Sound Firm Encased Only / Unsound Loose Knots & Holes	Face Width (Nominal) / Knots any Quality / Holes	Face Width (Nominal) / Knots any Quality / Holes	3/4 cross section
	2" / 3/4" / 5/8" 3" / 1 1/4" / 3/4" 4" / 1 1/2" / 1"	2" / 1" / 3/4" 3" / 1 1/2" / 1" 4" / 2" / 1 1/4"	2" / 1 1/4" / 1" 3" / 2" / 1 1/4" 4" / 2 1/2" / 1 1/2"	
Number of holes:	1 hole or equivalent in size per 3 lineal ft.	1 hole or equivalent per 2 lineal ft.	1 hole or equivalent per 1 lineal ft.	
Pin holes:	30 per sq. ft. on worst face	Not restricted	Not restricted	Not restricted
Grub holes:	3 per sq. ft.	6 per sq. ft.	20 per sq. ft. (1/2" or equiv. smaller)	Not restricted
Spike knots: (Entirely Across Face). (Not entirely across face)	1/4 displacement 1/3 displacement	1/3 displacement 1/2 displacement	1/2 displacement 2/3 displacement	3/4 displacement 3/4 displacement

APPENDIX 1(c)
Structural Joists and Planks
2" to 4" Thick 6" & Wider

Extracts from Grading Rules

Note: For economy grade refer to light fra[illegible]

Grades	Select Structural	No. 1	No. 2	No. 3
Uses:	In framing where both appearance and strength are of high importance	In framing where some appearance and fair strength is required	In framing where only strength is required	In framing where only fair strength is required. (Generally material is placed in this grade for one specific reason but may be of a higher grade otherwise)
Wane:	1/4T x 1/4W x full length 1/3T x 1/3W x 1/4 length	1/4T x 1/4W x full length 1/3T x 1/3W x 1/4 length	1/3T x 1/3W x full length 1/2T x 1/2W x 1/4 length	1/2T x 1/2W x full length 2/3T x 2/3W x 1/4 length
Skips:	Hit and miss, 1/16" X 4' or equivalent	Hit and miss, 1/16" X 4' or equivalent	Hit or miss, or heavy skip (1/8") X 2'	Hit or miss, or heavy skip (1/8") x full length
Pockets:	Large (4 sq. inches)	Large (4 sq. inches)	Unrestricted	Unrestricted
Stains & Rots: (refers to stain stains, white specks, honeycomb & unsound wood (soft rot)	Sap stain - unrestricted, Heart stain - 10% of piece. No white specks, honeycomb or soft rot allowed	Stain - unrestricted. No white speck, honeycomb or soft rot allowed	Stain - unrestricted, white specks - 1/3 vol. honeycomb - 1/16W x 2' (2 per 12'). No soft rot allowed	Stain & white speck - unrestricted, honeycomb - firm - 1/3W x 2' (2 per 12'). Soft rot - 1 patch 1/3 cross section x 1/10 length
Splits:	Short (equivalent to width of piece)	Short (equivalent to width of piece)	Equivalent to 1.5 X width	1/6 length
Shakes and checks:	Several up to 2' long - none thru	Several up to 2' long - none thru	Thru - 2' long. No thru 3' and up to 1/4 length. If breaks edge only 3/4 thru	Several thru up to 1/3 length. If breaks edge, less than width of edge knot and no longer than split
Shape of grain:	1 in 12	1 in 10	1 in 8	1 in 4
Warp. (Cup (C), Crook (CR), Bow, Twist)	1/2 medium, i.e. 2 x 6 x 16", C = 1/16", CR = 5/16", B = 2 1/2", T = 2 1/4"	1/2 medium, i.e. 2 x 6 x 16", C = 1/16", CR = 7/8", B = 3 1/4", T = 1"	Light, i.e. 2 x 6 x 16". C = 1/8", CR = 1 3/8", B = 5", T = 2 1/4"	Medium, i.e. 2 x 6 x 16". C = 1/8", CR = 1 3/4", B = 6 1/2", T = 2"

Knots and holes:	Nom. Width	Edge Knots Sound Firm	Center Line Knots, Sound Firm	Holes	Nom. Width	Edge Knots Sound Firm	Center Line Knots, Sound Firm	Holes	Nom. Width	Edge Knots Any Quality	Center Line Knots, Any Quality	Holes	Nom. Width	Edge Knots Any Quality	Center Line Knots, Any Quality	Holes
	3"	1/2"	1/2"	1/2"	3"	3/4"	3/4"	3/4"	3"	7/8"	7/8"	7/8"	3"	1 1/4"	1 1/4"	1 1/4"
	4"	3/4"	7/8"	3/4"	4"	1"	1 1/2"	1"	4"	1 1/4"	2"	1 1/4"	4"	1 3/4"	2 1/2"	1 3/4"
	6"	1 1/8"	1 7/8"	1"	6"	1 1/2"	2 1/4"	1 1/4"	6"	1 7/8"	2 7/8"	1 1/2"	6"	2 3/4"	3 3/4"	2"
	8"	1 1/2"	2 1/4"	1 1/4"	8"	2"	2 3/4"	1 1/2"	8"	2 1/2"	3 1/2"	2"	8"	3 1/2"	4 1/2"	2 1/2"
	10"	1 7/8"	2 5/8"	1 1/4"	10"	2 1/2"	3 1/4"	1 1/2"	10"	3 1/4"	4 1/4"	2 1/2"	10"	4 1/2"	5 1/2"	3"
	12"	2 1/4"	3"	1 1/4"	12"	3"	3 3/4"	1 1/2"	12"	3 3/4"	4 3/4"	3"	12"	5 1/2"	6 1/2"	3 1/2"

Number of holes:	1 or equivalent per 4 lineal ft.	1 or equivalent per 3 lineal ft.	1 or equivalent per 2 lineal ft.	1 or equivalent per 1 lineal ft.
Pin holes:	15 per sq. ft. - worst face	30 per sq. ft. - worst face	No restrictions	No restrictions
Grub holes:	1 per sq. ft. - worst fact	3 per sq. ft. - worst fact	6 sq. ft. - worst face	20 sq.ft. (1/2" or equivalent smaller)
Spike knots:	1/5 displacement	1/4 displacement	1/3 displacement	1/2 displacement

APPENDIX 1(d)
Stud Grading
2" to 4" Thick 2" to 6" Wide 10' and Shorter

Extracts from Grading Rules

GRADE	STUDS				ECONOMY
Uses	Load Bearing Walls				Temporary Construction, dunnage, etc.
Wane:	1/3T x 1/2W x full length 1/2T x 3/4W x 2' long				3/4 width. If across face 1/2 width must not be more than 1/4" scant for 1/3 the length or euivalent
Skips:	Hit or miss. In addition heavy or wide faces only (1/16" narrow, 1/8" thin)				1/4" scant in any direction
Bark pockets:	Unrestricted				Unrestricted
Stains and rots:	Stain allowed, white speck allowed, honeycomb (Firm) allowed. Soft Rot - 1/3 of cross section x 1/10 length, if patches equivalent size to end piece				Stain, white speck, honeycomb - allowed. Soft rot - 3/4 cross section
Splits:	2 x width of piece, can be on each end				1/3 length
Shakes and checks:	Several thru - 1/3 length				Not restricted except if it restricts the use of the piece
Slope of grain:	1 in 4				Not restricted
Warp: (Cup (C), Crook (CR), Bow, Twist)	1/2 medium - example: 2 x 4 x 8 C = 1/32, CR - 1/4, T = 3/4"				Unrestricted
Knots and holes:	Face Width (Nominal)	Edge Knots Any Quality	Center Line Knots Any Quality	Holes	3/4 cross section
	2	3/4"	3/4"	3/4"	
	3	1 1/4"	1 1/4"	1 1/4"	
	4	1 3/4"	2 1/2"	1 1/2"	
	5	2 1/4"	3 1/8"	1 3/4"	
	6	2 3/4'	3 3/4"	2"	
Number of holes:	1 per lineal foot or equivalent				
Pin holes:	Unrestricted				Unrestricted
Grub holes:	20 per sq. ft. or equivalent 1/2" or smaller				Unrestricted
Spike knots: (Entirely across face) Not entirely across face)	1/2 displacement 2/3 displacement				3/4 displacement 3/4 displacement

APPENDIX 1(e)
Boards

Excerpts from Grading Manuals
(Note: specifications are for a 1" x 8" x 12")

Note: #5 grade is similar to economy in dimension.

Grade	D Select	No. 2 Common	No. 3 Common	No. 4 Common	No. 5
Uses:	Shelving etc. where piece is seen	Varnish finish such as wall paneling	Paint finish - fence, etc.	Rough sheathing	Crating
Wane:	Face - none Back - 3/4T x 1/4W x 1/4 length	Face - none Back 1/2T x 1/6W x 1/3 length	Face - none Back - 2/3T x 1/4W x 1/2 length	Face - 1/2T x 1/8W x 1/6L Back - Heavy, if thru equivalent to holes	Heavy
Skips:	Face - 1 very light (1/64" x 6") Back - hit and miss (1/16") Edge - scant 1/2 length on 1 edge	Face - none Back - medium (1/6"D) x 1/4 length Edge - medium (1/6"D) x 1/3 length	Face - medium (1/16 x 12") Back - hit and miss 1 edge - 1/8" scant 1/2L or 1/16" scant x L	Face - hit and miss 1/16 scant Full L if 1 side surfaced 1 edge - 1/4" scant 1/2L or 1/8 scant x L	1/8" scant full length 1/2 narrow full length
Pockets:	* 1 very small	3 small dry (1/16" x 6")	Medium (1/16" x 12")	Large	Unrestricted
Pitch:	* medium - 2/3 face, less if heavy	Medium (1/2 Face)	Heavy 1/2 face	Heavy 1/2 face	Unrestricted
Pitch streak:	* 1 medium - (1/6W x 1/2 length)	2 very small (3/8" x 15")	2 small (1/2" x 1/6 length)	1/2 Face	Unrestricted
Stains and rots:	Stain - medium	Stain - medium, white specks - not allowed, honeycomb - not allowed, soft rot - not allowed	Stain - unrestricted, white specks - 1/8 area, honeycomb - not allowed, soft rot - not allowed	Stain - unrestricted, white specks - unrestricted, honeycomb - 1/4 face, soft rot - Scatt, 1/4 face	Spots and patches
Splits:	Short (width of piece, one end only)	Short (width of piece)	1/6 length one each end	1/3 length on each end	1/2 length
Shakes and checks:	Face - small (1/32" x 4") Back - medium (1/32" x 10")	Seasoning: 2 medium or equivalent (1/32" x 10") Roller: light on back for 1/4 length	Seasoning: medium (1/32" x 10") Roller: face - 1-3' light Back - medium 2/3 length	Seasoning: Unrestricted Roller: face - 2/3 length Back - heavy full length	Unrestricted
Warp: (Cup (C), Crook (CR)	Cup - very light. Crook - table 810A, i.e. 1 x 8 x 12 C = 1/16", CR = 1/16"	Cup - light, Crook - table 810b, i.e. 1 x 8 x 12 C = 1/8", CR = 7/8"	Cup - heavy, Crook - table 810b, i.e. 1 x 8 x 12 C = 3/16", CR = 9/16"	Cup - heavy, Crook - table 810b, i.e. 1 x 8 x 12 C = 1/4", CR = 2"	Unrestricted
Knots:	* 4 small (3/4") - fixed or equivalent Max, 15 sound intergrown No holes * only one of group can occur				Large (1 1/2"+)

Face	Red Sound Tight	Black Sound Tight	Face	Red Sound Tight	Black Sound Tight	Face	Red Sound Tight	Black Sound Tight
4	2"	3/4"	4	2 1/2"	3/4"	4	3"	1 1/2"
6	2 1/2"	1"	6	3"	1 1/4"	6	3 1/2"	2"
8	3"	1 1/4"	8	3 1/2"	1 1/2"	8	2/3w	2 1/2"
10	3 1/4"	1 3/8"	10	4"	1 3/4"	10	2/3w	3"
12	3 3/4"	1 1/2"	12	4 1/2"	2 1/4"	12	2/3w	3 1/2"

Black knot limit - 1 in 16' Fixed knots - 2 small Slough knot - 1 small (3/4")	Black knots - 2/3 size of Red - 2 per 12' Fixed knots - equal to hole - 2 per 12' Holes - limit to 1 in 16'	Holes and loose knots - 3 in 16'

Spike knots:	1/3 width (only 3 per 12')	1/2 width	Unrestricted	Unrestricted	Unrestricted
Pitch:	None	1/2" width, 1/2 length	Unrestricted	Unrestricted	Unrestricted
Pin holes	None	12 Scattered on 1 x 8 x 12	30 per sq. ft.	Unrestricted	Unrestricted
Small holes (1/4"):	None	None	4 worm holes	Unrestricted	Unrestricted
Torn or raised grain:	Light - (1/32" - Hand sized) - scattered	Torn - very light (1/64"D)	Torn - medium (1/16"D)	Heavy	Unrestricted

APPENDIX 2

EXTRACTS FROM ACTS AND REGULATIONS

Forests Act	2(a)
Alberta and Prairie Protection Act	2(b)
Forest and Prairie Protection Regulation	2(c)
Public Lands Act	2(d)
Timber Management Regulations	2(e)

APPENDIX 2(a)

FORESTS ACT

Right of entry

43 A forest officer while acting in the performance of his duties has the right to enter without warrant into and on any land and premises other than a private dwelling, store or office.

1971 c37 s41

APPENDIX 2(b)

EXTRACTS FROM
THE ALBERTA AND PRAIRIE PROTECTION ACT
ALBERTA REGULATION 135/72

Industrial Operations - General Precautions

12 An operator of a sawmill, planing mill, logging camp or any kind of industrial operation in or within 1 kilometre of the forest protection area shall, unless otherwise authorized by a forest officer,

(a) clear of all trees, shrubs and other inflammable material the area in which the mill, factory or operation is being located;

(b) maintain a cleared distance of not less than 30 metres from the mill, factory, structure or operation to the closest standing timber; and

(c) maintain a clear bare mineral soil surface extending at least 8 metres around each burner, pit or other source of fire.

AR 135/72;290/79

Fire Fighting Equipment

26 A person carrying on or being in charge of a timber, forest, mining, drilling or other industrial or commercial operation in or within 1 kilometre of any public land shall keep at the site available for immediate use an adequate water supply for fire fighting purposes plus at least the equipment listed in Table "A" in good working condition, according to the number of men employed at the site.

AR 135/72;290/79

27 Where heavy equipment such as bulldozers or water tankers are immediately available for fire fighting use at the site of operations, the forest superintendent may, in his discretion, permit the operator to have less than the minimum equipment provided for by Table "A".

AR 135/72

TABLE "A"

Required equipment for the control	Men employed at the site of operations									
	1	2	3	4	5	6-10	11-20	21-30	31-40	41+
Shovels	1	1	2	2	3	5	10	15	20	
Back pack with pump	0	0	1	2	3	5	10	15	20	Same as 30-40
Axe or pulaski ...	0	1	1	1	2	5	10	15	20	plus increase
Fire pump	0	0	0	0	0	0	0	1	1	by Director
Fire hose (metres)	0	0	0	0	0	0	450 metres	450 metres		
Power saw	0	0	0	0	0	0	0	1	1	

AR 135/72;290/79

APPENDIX 2(c)

GOVERNMENT OF THE PROVINCE OF ALBERTA

ALBERTA REGULATION 310/72

THE FOREST AND PRAIRIE PROTECTION REGULATIONS
PART II

FIRE HAZARD REDUCTION

Total Debris Disposal Requirements

3. Total disposal of debris by burning at a safe time is required on land cleared for the following operations:

(a) pipe lines having rights-of-way of 25 feet or more;
(b) oil and gas well sites and tank storage sites;
(c) road rights-of-way other than for winter use roads;
(d) power lines and telephone lines;
(e) sawmill, planing mill and logging camp sites;
(f) radio or micro wave sites;
(g) sand and gravel pit, dam, bridge and water storage sites;
(h) those dealing with the recovery of minerals as defined by The Mines and Minerals Act including tar sand development;
(i) airstrips other than those constructed for winter use and which are not accessible by road during the fire season;
(j) any building or structure;
(k) any other land use as may be prescribed by the Director.

4. (1) Before burning takes place all debris from areas cleared for the purposes of operations listed in section 3 shall be placed in windrows or piles not exceeding 200 feet in length and separated by 25 foot firebreaks.

(2) On rights-of-way less than 100 feet width, the windrows or piles shall be located and burned along the centre of the rights-of-way and on other cleared areas the windrows or piles shall not be placed and burned less than 50 feet from adjacent uncleared areas.

(3) Where waste material has not been totally consumed by burning, the residue may be disposed of in the following manner with the approval of an officer:

(a) on well sites within the "green zone" the residue may be compacted and buried in sump pits provided a minimum of four feet of mineral soil is compacted over the debris and the natural ground contours are maintained,
(b) on roads where deep fills are required in the grade, residue may be compacted and buried provided a minimum of four feet of mineral soil is compacted over the debris,
(c) residue may be buried in natural openings or in clearings adjacent to rights-of-way provided that a minimum of two feet of mineral soil is compacted over the debris and the natural ground contours are maintained,
(d) stumps that have been severed from trees and have not been completely disposed of by burning may be scattered adjacent to and out of sight of the right-of-way clearing.

(4) Total disposal of debris shall precede project constructon unless otherwise ordered by the forest superintendent due to fire danger but disposal time shall not exceed one year.

THE FOREST AND PRAIRIE PROTECTION REGULATIONS
PART II

Debris Disposal - Sawmills and Planing Mills

12 (1) The operation of a sawmill or planing mill which is located on public lands and which has an average production volume of 6 324 m^3 or over in any one year shall dispose of waste slabs, edgings, shavings and sawdust in an enclosed burner approved by the Director.

(2) The operator of a sawmill or planing mill which is located on public lands and which has an average production of less than 6 324 m^3 and more than 791 m^3 in any one year shall dispose of all waste slabs, edgings, shavings and sawdust in an approved shielded, open pit, forced air burner or by any alternate method approved by the Director.

(3) The operator of a sawmill or planing mill which is located on public lands and which has an average production volume of 791 m^3 or less in any one year shall dispose of all debris other than sawdust by burning in a pit which meets the approval of an officer, at a safe time between November 1st and March 31st, and shall ensure that all fires are completely extinguished by March 31st.

(4) The operator of a sawmill or planing mill referred to in subsection (3) who wishes to dispose of waste slabs, edgings, shavings or sawdust during the fire season a burner as indicated in subsection (2) will be required.

(5) A fire permit shall be required during the fire season for all debris fires including disposal carried out in burners.

AR 310/72;297/79

Debris Disposal - Pole and Post Manufacturing Operations

13(1) Debris accumulated from post or pole operations shall be disposed of by burning.

(2) During the fire season a fire permit will be required under subsection (1).

(3) It is the responsibility of the owner, operator, licensee or permittee to prevent a fire from spreading and to ensure that it is completely extinguished by March 31st of each year.

AR 310/72

APPENDIX 2(d)

THE PUBLIC LANDS ACT

Prohibitions

51. (1) No person shall cause, permit or suffer

(a) the accumulation of waste material, debris, refuse or garbage on public land, or

(b) the existence on public land of any structure or excavation of any kind that is undesirable in the Minister's opinion, or

(c) the existence on public land of any condition which, in the opinion of the Minister, may cause danger by fire to life, property or forest growth, or

(d) the doing of any act on public land that may injuriously affect watershed capacity, or

(e) the disturbance of any public land in any manner that results or, in the opinion of the Minister is likely to result, in injury to the bed or shore of any river, stream, watercourse, lake or other body of water or land in the vicinity thereof, or

(f) the creation of any condition on public land which, in the Minister's opinion, is likely to result in soil erosion.

(2) In respect of any act prohibited by this section, the Minister may

(a) order the person responsible for doing the act to take such remedial action as the Minister may direct within such time as the Minister considers reasonable, and

(b) if that person fails to comply with the order of the Minister, cause any remedial action to be taken that the Minister considers necessary and recover any costs so incurred as a debt owing to the Crown.

(3) The Crown has, in addition to any cause of action under subsection (2), a right of action against the person to whom an order is given under this section for exemplary damages by reason of the doing of an act prohibited by subsection (1) or the failure to comply with the order or both.

(R.S.A. 1970, c. 297, s. 51)

General penalty

55. Every person who is guilty of an offence under this Act or the regulations for which no penalty is provided is liable on summary conviction to a fine not exceeding $1000 and in default of payment to imprisonment for a term not exceeding 90 days.

(R.S.A. 1970, c. 297, s. 55; 1977, c. 39 s. 8)

APPENDIX 2(e)

EXTRACTS FROM
TIMBER MANAGEMENT REGULATIONS

Alberta Regulation 60/73 with amendments to
and including Alberta Regulation 301/81

Timber Harvesting Operations

98 A licensee and, at the request of the Minister, a commercial timber permittee shall submit an annual operating plan to the Minister for approval

(a) before the 1st day of March if operations are to commence between the 1st day of May and the 30th day of October, or
(b) before the 1st day of September if operations are to commence between the 1st day of November and the following 30th day of April.

AR 60/73

99 All timber producers shall measure and scale timber volumes in accordance with the procedures and scaling regulations established by the Minister.

AR 60/73

100 Every person who harvests timber on public land shall

(a) conduct his timber operations in accordance with the approved annual operating plan,
(b) comply with the terms and conditions of the timber disposition,
(c) cut timber progressively,
(d) remove and manufacture timber as it is cut,
(e) avoid excessive waste when cutting timber and manufacturing timber products,
(f) cut all timber at the height not more than 30 centimetres above average ground level,
(g) dispose of all limbs, tops and other debris in accordance with the requirements stated in The Forest and Prairie Protection Regulations, Part II.
(h) maintain all his campsites in a tidy and sanitary condition, and
(i) insure that
    (i) the disposal of any refuse or debris, or
    (ii) the location of any structure or excavation is in a place and is done in a manner that does not impede the natural flow of water in any watercourse or contaminate or pollute any river, stream, lake, well, or other body or source of water.

AR 60/73;338/79;301/81

APPENDIX 2(e) cont'd

EXTRACTS FROM
TIMBER MANAGEMENT REGULATIONS

Alberta Regulation 60/73 with amendments to
and including Alberta Regulation 301/81

Records

112 Every licensee and permittee shall maintain accurate and complete records of all the timber he processes including a complete accounting by receiver of all the timber and timber products he has shipped and such records shall be made available to the Minister and to any forest officer upon request.

AR 60/73

113 Immediately before shipment or as it is being prepared for shipment timber shall be measured and the volume thereof accurately recorded.

AR 60/73

114 Where the Minister prescribes a specific form for the keeping of records and requires the holder of a timber disposition to use the form the holder of the timber disposition shall complete the form in an accurate manner.

AR 60/73

115 Unless the Minister requests otherwise, a licensee or a commercial timber permittee shall submit to the Minister a complete and accurate report in Form TM7 or TM8 within 21 days following the end of each month within which manufacturing, measuring or selling of timber was carried on pursuant to a license or permit.

AR 60/73

116 (1) Subject to subsection (2), every person who holds a timber disposition and every person who purchases timber and primary timber products, shall obtain and keep one of the following from the person selling or transporting the timber or primary timber products:

(a) a completed copy of Form TM9;
(b) a sworn affidavit in Form TM12 declaring the land location from which the timber was cut.

(2) Where a person buys timber or primary timber products from a bona fide retailer of timber or primary timber products, a bill of sale or invoice may be accepted in substitution for Form TM 9 or Form TM 12.

AR 60/73;220/77

APPENDIX 2(e) cont'd

EXTRACTS FROM
TIMBER MANAGEMENT REGULATIONS

Alberta Regulation 60/73 with amendments to
and including Alberta Regulation 301/81

Transportation Records

117 Before a producer ships primary forest products he shall accurately complete a Form TM 9 (or similar form approved by a forest officer) for each load of the product and shall give the carrier two copies thereof before the load is transported.

AR 60/73;220/77

118(1) A person transporting a primary forest product shall on demand of a forest or peace officer produce an accurate and complete written record for his load showing

(a) the vehicle license number
(b) the kind and quantity of produce
(c) the origin and destination
(d) the vendor's and purchaser's (if any) name and address,

which record shall be on the appropriate form, either Form TM 9 (or similar form approved by a forest officer) or Form TM 66 but when the vendor or purchaser has neglected to provide the appropriate form a bill of sale or an invoice may be accepted in substitution.

(2) When a person cannot comply with the provision of subsection (1) he shall give to the forest or peace officer a statement in writing accurately providing the information required to be given pursuant to subsection (1).

(3) A compliance with the provision of subsection (2) is not a bar to a penalty being levied for a contravention of subsection (1).

AR 60/73;298/73;220/77

119 Upon delivery the carrier referred to in section 118 shall leave with the consignee of the product delivered a copy of every prescribed form, bill of lading, bill of sale or invoice which he received from the shipper.

AR 60/73;72/73

120 Every shipper, vendor, carrier and consignee or receiver of a primary forest product shall retain in his possession for a period of five years all documents and records connected with each sale, shipment, delivery and receipt of forest products, and shall produce same upon request for inspection by a forest officer, an officer of the Royal Canadian Mounted Police, a special constable, a peace officer or any other person authorized for the purpose by the Minister.

AR 60/73;220/77

121 Every person who ships timber and primary timber products by rail or water transportation shall retain a copy of the bill of lading showing the kind and quantity of timber and primary timber products shipped.

AR 60/73

122 The bill of lading referred to in section 121 shall, upon request, be produced to an officer.

AR 60/73;72/73

APPENDIX 3

EXAMPLE OF SLAB STUDY

The purpose of a slab study is to give a simple estimate of the proportion of material lost in heavy slabbing. The final volume results cannot be considered exact because of the subjective method of measurement. It is therefore suggested that when a study indicates that heavy slabbing may be the practice, a batch study should be made to substantiate the indication.

Procedure:

The objective is to estimate the volume of salable merchantable material in slabs over a period of time.

(a) The study should be at least 30 minutes of running time in duration.

(b) Count all merchantable pieces going out in the slabs. A merchantable piece is deemed to be a minimum 1" X 4" X 8' piece.

(c) Volume loss per shift = $\frac{\text{shift time}}{\text{study time}}$ X volume loss during study time.

(d) Per cent loss = $\frac{\text{volume loss per shift}}{\text{volume output per shift}}$ X 100.

A batch study should be considered if the loss exceeds three per cent.

Example:

A mill produces 70 000 fbm in an eight hour shift.

In a study of 30 minutes duration the following was estimated as lost in the slabs.

1 - 1 X 6 X 8	=	4.000 fbm
3 - 1 X 4 X 8	=	8.000 fbm
2 - 1 X 4 X 12	=	6.667 fbm
3 - 1 X 4 X 12	=	12.000 fbm
1 - 2 X 4 X 8	=	5.333 fbm
TOTAL		36.000 fbm

Shift loss = $\frac{8 \text{ hr}}{.5 \text{ hr}}$ X 36 = 576 fbm

Percent loss = $\frac{576 \text{ X } 100}{70\ 000}$ = 0.83%

If the mill produced 20 million fbm per year a loss of 164 000 fbm would occur.

APPENDIX 4

EXAMPLE OF SAWMILL TRIMMING STUDY

Only a minimum of trimming should be done at the sawmill. Surfacing will further reduce items such as wane, thus the guidelines set for the study are considered the maximum allowable. If trimming generally exceeds these allowances it is considered excessive.

Procedure:

(a) Use an unbiased sampling system. For example, take every fifth piece going up the green chain whether the piece requires trimming or not. Spacing of the pieces depends upon the flow of the mill. Remember there must be time to take three tallies of the pieces.

(b) A minimum of 100 pieces should be taken.

(c) Tally the original length of the piece and your estimate of the final length using the following limits.

(1) Soft rot may be trimmed off.

(2) Wane may be trimmed back to half the thickness or half the width.

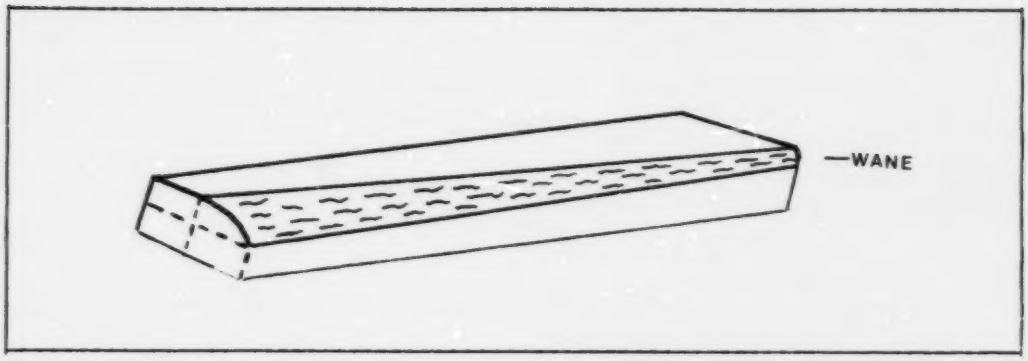


FIGURE 2: Example of a piece requiring no trim.

(d) Tally the actual final length after trimming.

(e) Compile the volumes of your estimate and the actual trim. If the actual trim is more than your estimate the trimming is excessive.

Example:

Original length	Your Estimate Using Maximum Trim	Actual Trim at Trim Saw
2 X 4 X 16	2 X 4 X 14 = 9.333 fbm	2 X 4 X 12 = 8.000 fbm
2 X 4 X 16	2 X 4 X 14 = 9.333 fbm	2 X 4 X 16 = 10.666 fbm
2 X 6 X 12	2 X 6 X 10 = 10.000 fbm	2 X 6 X 8 = 8.000 fbm
	28.666 fbm	26.666 fbm

Over trim = 28.666 = 2.000 fbm

Percent overtrim = $\frac{2.000 \times 100}{28.666}$ = 6.98%.

In the above case trim is excessive. If the mill produced 20 million fbm a loss of 1 396 000 fbm would occur.

APPENDIX 5

LUMBER MEASUREMENT PROCEDURES

1. Size Measurements:

   (a) Minimum 100 pieces at random measured no less than two feet from the end (60 cm).

   (b) Measurements to be alternated from end to end. Approximately half of the measurements to be taken from each end of the lumber pile.

   (c) Measure width and thickness as per diagram to the nearest 1/16 inch (or one millimetre if metric).

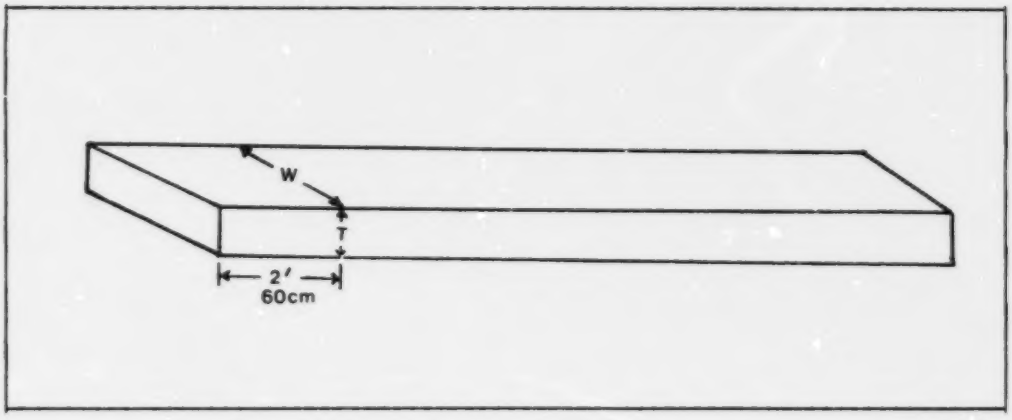


FIGURE 3: Measurements required for lumber sizes.

(d) Measurements are recorded on Section 1 (Nominal Size) of Lumber Measurement Sheet. Note that heavy lines show maximum and minimum tolerance levels for each class.

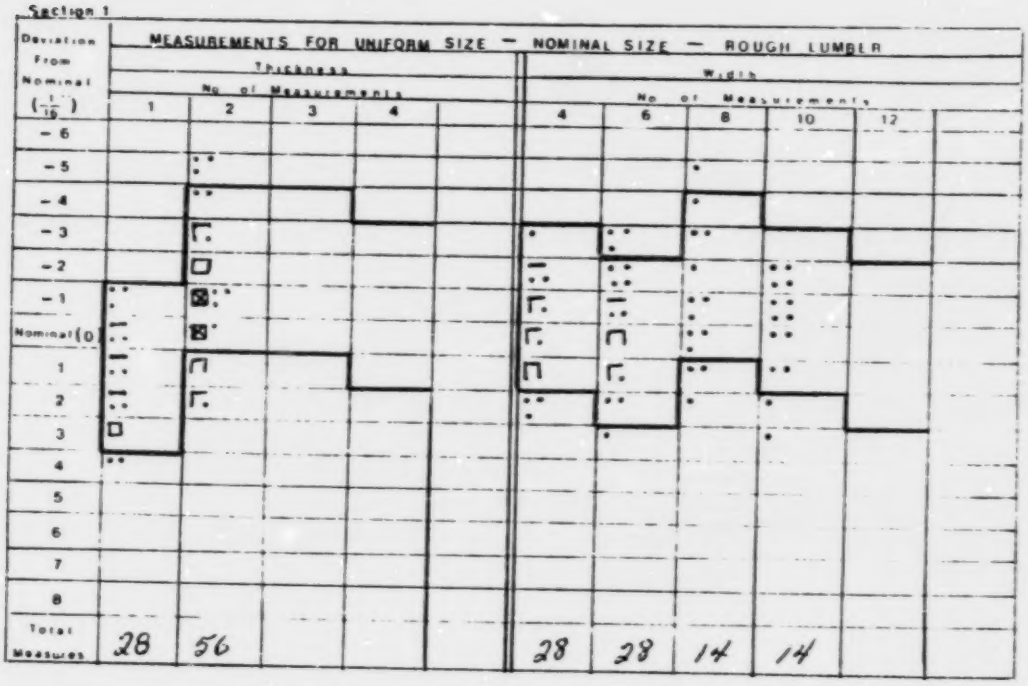


FIGURE 4: Tally of lumber sizes.

Notes: One thickness and one width measurement were taken on each of 84 boards for a total of 168 measurements. A total of 31 measurements or 18.5% (31/168) were outside tolerance limits. This is acceptable (see Section F under Manufacturing Items of Guidelines for Mill Inspections).

2. Wedge-Shaped Lumber:

(a) These measurements should only be taken when wedge-shaped lumber is evident or suspected.

(b) Lumber may be wedge shaped along the length. Two measurements must be taken at each end of the board.

(c) Measure width and thickness no less than two feet (60 cm) to the nearest 1/16 inch (or one millimetre if metric) at each end.

(d) The thickness measurements must be alternated at each end. See diagram.

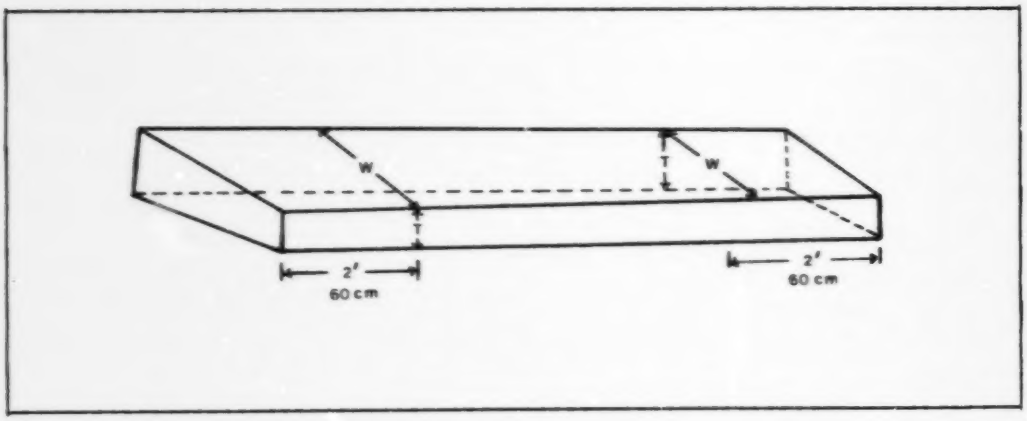


FIGURE 5: Measurements required on wedge shaped lumber.

(e) 30 to 100 measurements should be taken on lifts and scattered through the range of sizes.

(f) Record actual measurements on Section 2 (wedge shaped lumber size) of measurement sheet.

(g) Sizes can also be recorded in Section 1 at the same time but should be alternated from end to end.

(h) A board will be classified as unsatisfactory if one or more of the four measurements fall outside the tolerance limits. The maximum allowable wedge shaped boards is set at 20% of the total.

MEASUREMENT FOR WEDGE SHAPED LUMBER

Nominal Lumber Size 1x4				Nominal Lumber Size 2x4				Nominal Lumber Size 2x8			
Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width
0 15	4 0	1 0	3 13	2 0	3 15	(2')	3 13	1 12	7 12	(1")	7 15
1 0	4 0	1 0	3 14	1 15	3 14	1 15	3 14	(1")	7 11	1 13	7 15
1'	4'	1 1	3 14	1 14	4 0	1 14	3 14	1 13	7 13	2 0	(8')
1'	4'	1 1	3 15	1 15	4'	1 13	3 15	1 15	8 0	(2')	8 0
1	(4 2)	1'	4 0	(2')	(4 2)	1 14	4 0	(2')	(8')	(2 2)	8'
1	(4 2)	1 1	3 13	(2 2)	4'	1 15	4'	(2 2)	(8 2)	(1 15)	7 15
1	4	1 1	4'	(2 0)	4 0	2 0	3 15	2 0	7 13	2 0	7 14
No Wedge Shaped 2				No Wedge Shaped 4				No Wedge Shaped 5			

FIGURE 6: Tally of measurements on wedge shaped lumber.

Note: Large numbers signify whole numbers, small numbers signify 1/16th.

i.e. 1^3 = 1 3/16.

Out of 21 boards, 11 were beyond the tolerance due to wedge shaped cutting. This amounts to more than 20% which is unacceptable.

FIGURE 7: Lumber Measurement Sheet

Alberta
ENERGY AND
NATURAL RESOURCES

LUMBER MEASUREMENT SHEET

Mill _____ Study No. _____

Tally Man _____ Date _____

Section 1

Deviation From Nominal (1/10")	MEASUREMENTS FOR UNIFORM SIZE – NOMINAL SIZE – ROUGH LUMBER										
	Thickness of Measurements					Width of Measurements					
	1	2	3	4		4	6	8	10	12	
-6											
-5											
-4											
-3											
-2											
-1											
Nominal (0)											
1											
2											
3											
4											
5											
6											
7											
8											
Total Measures											
Average ●											

Tolerance limits indicated by heavy line

● Required Only On Mill Studies

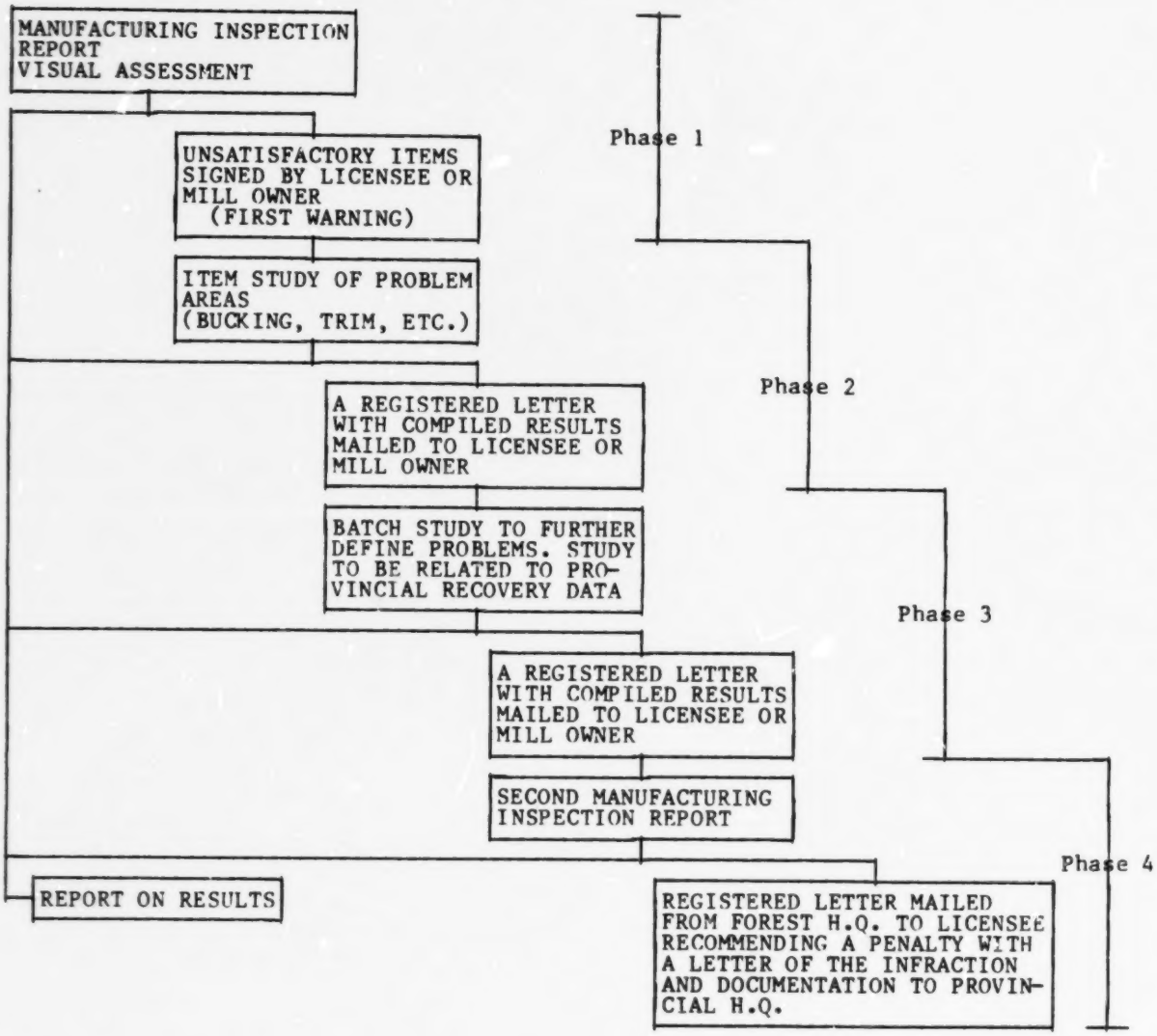
Section 2

MEASUREMENT FOR WEDGE SHAPED LUMBER

Nominal Lumber Size _____				Nominal Lumber Size _____				Nominal Lumber Size _____			
Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width	Thickness	Width
No. Wedge Shaped _____				No. Wedge Shaped _____				No. Wedge Shaped _____			

APPENDIX 6

FLOW CHART OF INSPECTIONS AND STUDIES


MANUFACTURING INSPECTION REPORT VISUAL ASSESSMENT
UNSATISFACTORY ITEMS SIGNED BY LICENSEE OR MILL OWNER (FIRST WARNING)
ITEM STUDY OF PROBLEM AREAS (BUCKING, TRIM, ETC.)
A REGISTERED LETTER WITH COMPILED RESULTS MAILED TO LICENSEE OR MILL OWNER
BATCH STUDY TO FURTHER DEFINE PROBLEMS. STUDY TO BE RELATED TO PROVINCIAL RECOVERY DATA
A REGISTERED LETTER WITH COMPILED RESULTS MAILED TO LICENSEE OR MILL OWNER
SECOND MANUFACTURING INSPECTION REPORT
REPORT ON RESULTS
REGISTERED LETTER MAILED FROM FOREST H.Q. TO LICENSEE RECOMMENDING A PENALTY WITH A LETTER OF THE INFRACTION AND DOCUMENTATION TO PROVINCIAL H.Q.
Phase 1
Phase 2
Phase 3
Phase 4

NOTE: No time parameter is given as it may or may not be possible to rectify the unsatisfactory items within a short time. The inspecting officer's judgment is required on the matter of time.

APPENDIX 7

SAFETY

Personal safety should be considered vital when conducting an inspection or a study. Adequate safety equipment should be chosen and the working area considered carefully.

(1) Equipment - The following equipment may be necessary depending upon the situation and length of time spent in the area:

(a) Hard hat - should be considered at all times.

(b) Eye protection - may be required particularly when glasses are not worn and when a person is subjected to flying chips.

(c) Ear protection - may be required when a person is subjected to a prolonged period in a high noise area.

(d) Safety boots - desirable and may be mandatory in some mills and in some locations.

Each individual involved in an inspection or study should obtain the necessary equipment before entering the mill yard. Some mills have equipment on hand and will oblige in providing same if necessary.

(2) Conditions - All persons participating in an inspection or study should make themselves familiar with their surroundings before proceeding with the job.

(a) Danger sign should be noted so those areas may be avoided at a later time.

(b) In higher risk areas the working conditions should be viewed carefully before placing a person in the position.

(c) Attempts to cross moving chains or in front of working equipment should be avoided. It is sometimes best to set up equipment during a work break unless the mill staff are aware of your purpose and are prepared to stop for a while.

(d) The aid of company personnel (foremen, scalers) in coordination is invaluable as they know the situations well and are acquainted with the workers. Their participation should be encouraged.

(e) In the yards, working patterns of equipment should be considered, especially fork lifts carrying trees where the span is deceiving.

Smoking is usually restricted around most mills and confined to lunch rooms. As a public image and personal courtesy, these restrictions should be adhered to by any staff involved in a project.

GLOSSARY

Bucking - Cross-cutting felled trees into logs or bolts.

Cant - A log that has been slabbed on one or more sides by the headsaw for subsequent breakdown into lumber by other machines.

Casehardening - A condition of lumber in which the wood contains varying degrees of stress set at different depths below the surface, causing it to cup when resawn or worked. Often caused by poor kiln drying procedures.

Kiln Schedule - A prescribed series of dry-bulb and wet-bulb temperatures and air velocities used in drying a kiln charge of lumber or other wood products.

Slabbing - Removing the outer portion of a log.

Snipe Ends - A pointed end on a piece of lumber.

LIST OF REFERENCES

Mullin, E. J. and McKnight, T. S., 1981. Canadian Woods, Their Properties and Uses. 3rd Edition. (ISBN 0-8020-2430-0). Minister of Supply and Services Canada. Ottawa.